

Tropical Cyclone Report  
Hurricane Hector  
(EP092006)  
15-23 August 2006

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Hector was a category 2 hurricane on the Saffir-Simpson Hurricane Scale that remained over the open waters of the northeastern Pacific Ocean.

a. Synoptic History

Hector formed from a tropical wave that exited the west coast of Africa on 31 July. The wave was rather ill-defined as it moved over the eastern Atlantic, but became more convectively active and easier to track after entering the eastern Caribbean Sea. On 10 August, the wave moved across Central America and entered the northeastern Pacific Ocean. Shower and thunderstorm activity gradually increased as the wave passed south of the Gulf of Tehuantepec and a broad low pressure area developed about 375 n mi south of Acapulco, Mexico on 13 August. The system continued to become organized on 14 August and Dvorak classifications were initiated early on 15 August. Additional development resulted in the formation of a tropical depression around 1800 UTC 15 August about 650 n mi south-southwest of the southern tip of Baja California.

The “best track” chart of the tropical cyclone’s path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1. Moving west-northwestward to the south of a mid-level high pressure ridge that extended from northern Mexico westward into the northeastern Pacific Ocean, the depression quickly strengthened and became a tropical storm at 0000 UTC 16 August. Despite initially being in an environment of moderate north-northeasterly shear, Hector was able to steadily strengthen, reaching hurricane status at 0600 UTC 17 August. While continuing west-northwestward, the hurricane quickly intensified, and it is estimated that Hector reached its peak intensity of 95 kt at 0600 UTC 18 August, while centered about 900 n mi southwest of the southern tip of Baja California.

Hector remained a category 2 hurricane for about 24 h. Thereafter, it began to encounter cooler sea surface temperatures and some westerly shear, which initiated weakening. Hector weakened below hurricane strength by 1200 UTC 20 August. Shortly after this time, Hector approached a weakness in the subtropical ridge near 135°W longitude, which produced a considerable reduction in its forward speed and a turn toward the northwest. On 21 August, deep convection became confined to the northeast portion of the circulation, due to southwesterly shear from a small upper low to the northwest of Hector. The shear was not strong enough to completely weaken the tropical cyclone and Hector remained a tropical storm with 45 kt winds

for about 24 h. After the remaining shower and thunderstorm activity dissipated on 22 August, the cyclone turned westward in response to the low-level easterly wind flow. Hector weakened to a tropical depression at 0000 UTC 23 August, and to a remnant low 6 h later. The remnant circulation of Hector dissipated on 24 August about 750 n mi east of the Hawaiian Islands.

b. Meteorological Statistics

Observations in Hector (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB), and the U. S. Air Force Weather Agency (AFWA). Microwave satellite imagery from NOAA polar-orbiting satellites, the NASA Tropical Rainfall Measuring Mission (TRMM), the NASA QuikSCAT, and Defense Meteorological Satellite Program (DMSP) satellites were also useful in tracking Hector. The estimated peak intensity of 95 kt at 0600 UTC 18 August is based on a blend of subjective and Advanced Dvorak T-numbers (ADT).

On 21 and 22 August, there were several QuikSCAT overpasses that were extremely helpful in determining Hector's intensity as it weakened. Despite Dvorak intensity estimates of only 30 to 35 kt, three successive QuikSCAT overpasses indicated maximum winds of 35 to 45 kt. These passes are the basis for a 5 to 10 kt increase in the intensity of Hector over the operationally estimated values between 1200 UTC 21 August and 0600 UTC 22 August.

Only one ship observation of winds of tropical storm force or greater was received in association with Hector. The ship **Barcelona Bridge** (call sign A8CJ2) reported 35 kt winds near an outer convective band about 180 n mi north-northwest of Hector at 0000 UTC 16 August. This observation and QuikSCAT data from shortly thereafter supported Hector's upgrade to a tropical storm.

c. Casualty and Damage Statistics

There were no reports of damage or casualties associated with Hector.

d. Forecast and Warning Critique

The development of Hector was fairly well anticipated. The incipient disturbance from which Hector developed was introduced into the Tropical Weather Outlook (TWO) at 1700 UTC 14 August, or about 26 h prior to formation. This forecast however, expected the development to be slow to occur. The TWO first mentioned the possibility of tropical depression formation about 14 h prior to genesis.

A verification of official and guidance model track forecasts is given in Table 2. Average official track errors for Hector were 25, 41, 56, 72, 97, 85, and 64 n mi for the 12, 24, 36, 48, 72, 96, and 120 h forecasts, respectively. The number of forecasts ranged from 28 at 12 h to 10 at 120 h. These errors are very much below the average long-term official track errors, especially

at 72 h and beyond (Table 2). This was the first time since NHC began 5-day forecasts in 2001 that average official track errors for a single tropical cyclone were less than 100 n mi at all forecast times. The official 120 h track forecast error of 64 n mi for Hector is the lowest 5-day average forecast error for any east Pacific storm with five or more 5-day forecasts. In fact, the track error is nearly half of the previous low average 120 h error of 120 n mi (5 forecasts) for Hurricane Hilary in 2005. Overall, the track models were in very good agreement, except for the UKMET model which had a southward bias. The Florida State Superensemble (FSSE) track errors were lower than the official forecasts at all time periods and the GUNA consensus forecasts were lower than the NHC forecasts through 72 h.

Average official intensity errors were 7, 9, 12, 13, 13, 14, and 14 kt for the 12, 24, 36, 48, 72, 96, and 120 h forecasts, respectively (Table 3). For comparison, the average long-term official intensity errors are 6, 11, 14, 17, 19, 18, and 19 kt, respectively. In general, the intensity forecasts underestimated the strength of Hector. Initial NHC forecasts did not accurately predict the rapid pace of strengthening nor the peak intensity, and later forecasts expected Hector to weaken too quickly. Similar trends were exhibited by the intensity guidance.

Table 1. Best track for Hurricane Hector, 15-23 August 2006.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
15 / 1800	12.9	113.5	1006	30	tropical depression
16 / 0000	13.0	114.6	1003	35	tropical storm
16 / 0600	13.1	115.6	1000	40	"
16 / 1200	13.3	116.4	995	50	"
16 / 1800	13.7	117.2	992	55	"
17 / 0000	14.1	118.1	990	60	"
17 / 0600	14.4	119.3	986	65	hurricane
17 / 1200	14.6	120.5	979	75	"
17 / 1800	14.8	121.6	975	80	"
18 / 0000	15.2	122.8	973	85	"
18 / 0600	15.6	124.0	966	95	"
18 / 1200	16.0	125.2	970	90	"
18 / 1800	16.4	126.4	970	90	"
19 / 0000	16.8	127.5	970	90	"
19 / 0600	17.2	128.6	972	90	"
19 / 1200	17.6	129.6	974	80	"
19 / 1800	18.1	130.6	978	75	"
20 / 0000	18.6	131.5	981	75	"
20 / 0600	19.1	132.3	983	70	"
20 / 1200	19.6	133.1	988	60	tropical storm
20 / 1800	20.1	133.9	995	50	"
21 / 0000	20.7	134.4	1000	45	"
21 / 0600	21.1	134.7	1000	45	"
21 / 1200	21.6	135.0	1002	45	"
21 / 1800	22.0	135.3	1002	45	"
22 / 0000	22.5	135.6	1003	45	"
22 / 0600	22.6	136.1	1005	40	"
22 / 1200	22.7	136.6	1007	35	"
22 / 1800	22.8	137.1	1007	35	"
23 / 0000	22.8	137.8	1009	30	tropical depression
23 / 0600	22.7	138.7	1009	30	low
23 / 1200	22.7	139.7	1009	25	"
23 / 1800	22.9	140.8	1009	25	"
24 / 0000	23.1	142.0	1009	25	"
24 / 0600	23.3	143.5	1009	25	"
24 / 1200					dissipated
18 / 0600	15.6	124.0	966	95	minimum pressure

Table 2. Preliminary track forecast evaluation (heterogeneous sample) for Hurricane Hector, 15-23 August 2006. Forecast errors (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
CLP5	27 (28)	52 (26)	75 (24)	106 (22)	166 (18)	201 (14)	206 (10)
GFNI	33 (26)	61 (23)	89 (22)	114 (20)	167 (16)	245 (12)	328 ( 8)
GFDI	28 (28)	42 (26)	<b>54 (24)</b>	<b>63 (22)</b>	<b>96 (18)</b>	119 (14)	163 (10)
GFSI	29 (28)	<b>39 (26)</b>	<b>55 (24)</b>	77 (22)	132 (17)	125 (13)	144 (10)
AEMI	29 (28)	43 (26)	62 (24)	84 (22)	112 (18)	100 (14)	89 (10)
NGPI	37 (28)	74 (26)	114 (24)	153 (22)	181 (18)	174 (14)	190 (10)
UKMI	35 (26)	63 (24)	91 (22)	119 (20)	231 (16)	316 (12)	411 ( 8)
BAMD	39 (28)	68 (26)	89 (24)	118 (22)	139 (18)	183 (14)	268 (10)
BAMM	<b>23 (28)</b>	<b>35 (26)</b>	<b>47 (24)</b>	<b>62 (22)</b>	<b>90 (18)</b>	115 (14)	138 (10)
BAMS	35 (28)	58 (26)	80 (24)	101 (22)	142 (18)	142 (14)	127 (10)
CONU	<b>24 (28)</b>	<b>35 (26)</b>	<b>44 (24)</b>	<b>54 (22)</b>	<b>86 (18)</b>	97 (14)	100 (10)
GUNA	<b>21 (26)</b>	<b>29 (24)</b>	<b>38 (22)</b>	<b>47 (20)</b>	<b>83 (15)</b>	86 (11)	68 ( 8)
FSSE	<b>23 (26)</b>	<b>36 (24)</b>	<b>48 (22)</b>	<b>58 (20)</b>	<b>90 (16)</b>	<b>78 (12)</b>	<b>60 ( 8)</b>
OFCL	25 (28)	41 (26)	56 (24)	72 (22)	97 (18)	85 (14)	64 (10)
NHC Official (2001-2005 mean)	35 (1300)	60 (1152)	83 (1009)	103 (877)	145 (652)	192 (465)	231 (313)

Table 3. Preliminary intensity forecast evaluation (heterogeneous sample) for Hurricane Hector, 15-23 August 2006. Forecast errors (kt) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
SHF5	7.5 (28)	9.5 (26)	<b>10.5 (24)</b>	<b>13.0 (22)</b>	15.3 (18)	16.6 (14)	17.2 (10)
GFDI	9.2 (28)	12.5 (26)	15.2 (24)	15.0 (22)	14.3 (18)	<b>10.3 (14)</b>	<b>9.6 (10)</b>
SHIP	9.1 (28)	12.5 (23)	16.0 (20)	18.5 (19)	17.5 (16)	14.8 (13)	16.7 (10)
DSHP	9.1 (28)	12.5 (23)	16.0 (20)	18.5 (19)	17.5 (16)	14.8 (13)	16.7 (10)
FSSE	9.1 (26)	12.8 (24)	15.5 (22)	16.8 (20)	18.2 (16)	18.3 (12)	23.0 ( 8)
ICON	9.0 (28)	12.1 (23)	15.5 (20)	16.1 (19)	14.0 (16)	<b>12.2 (13)</b>	<b>13.2 (10)</b>
OFCL	6.8 (28)	8.7 (26)	11.9 (24)	13.2 (22)	13.3 (18)	13.6 (14)	14.0 (10)
NHC Official (2001-2005 mean)	6.2 (1300)	10.8 (1152)	14.3 (1009)	16.5 (876)	18.7 (652)	18.3 (465)	19.3 (313)

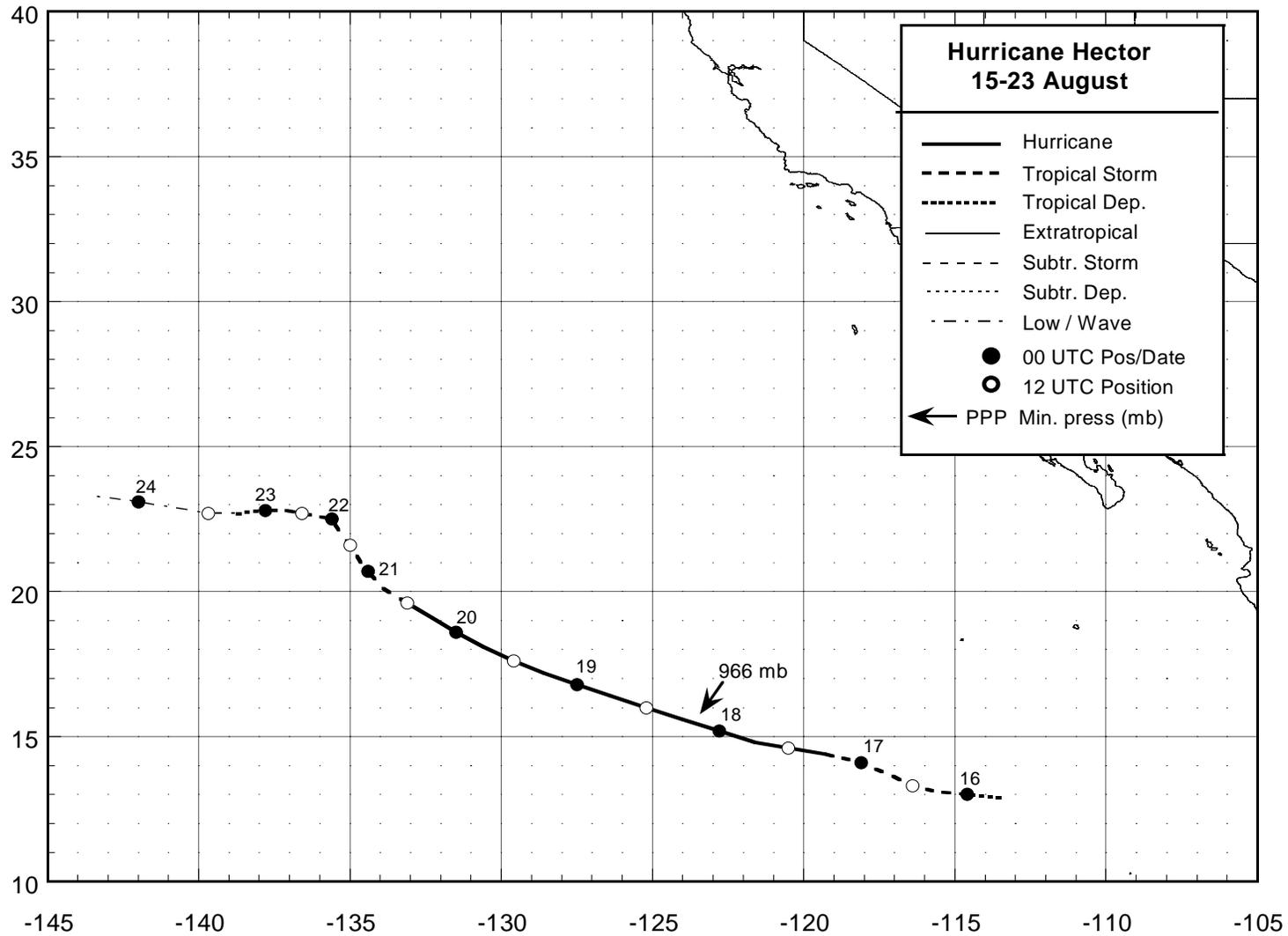


Figure 1. Best track positions for Hurricane Hector, 15-23 August 2006.

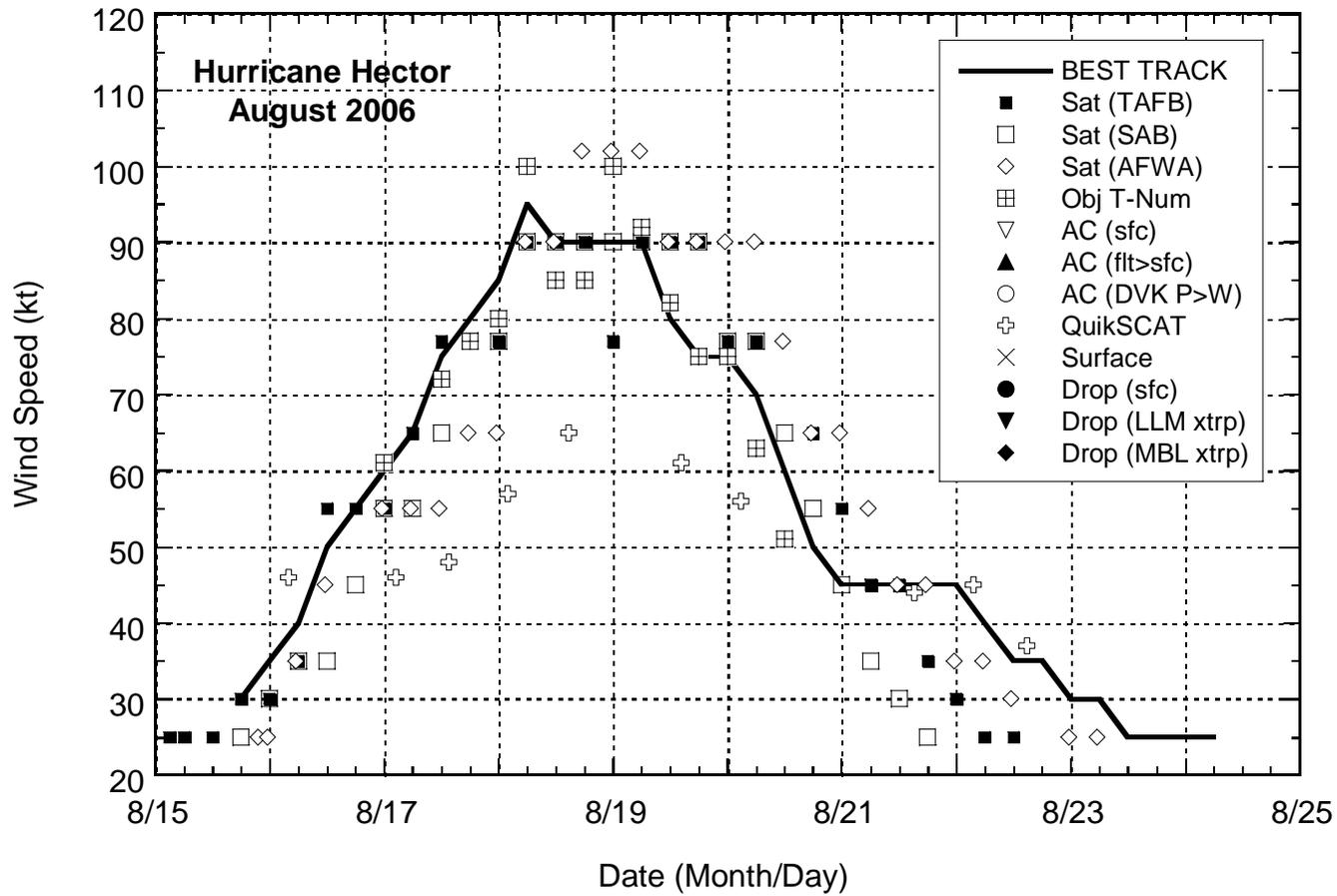


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Hector, 15-23 August 2006. Objective Dvorak estimates represent linear averages of adjusted raw T-numbers from the Advanced Dvorak Technique over a three-hour period centered on the nominal observation time.

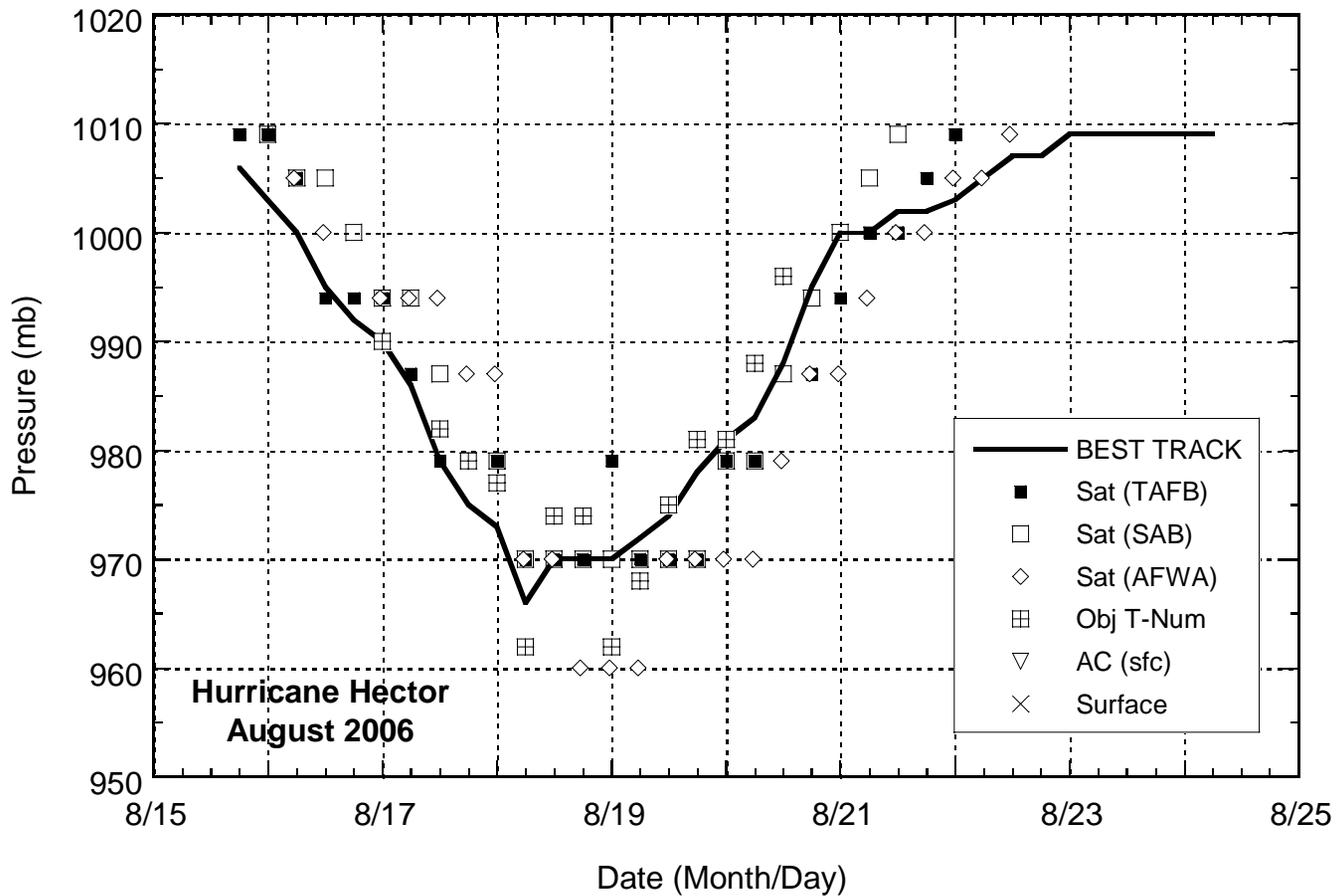


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Hector, 15-23 August 2006. Objective Dvorak estimates represent linear averages of adjusted raw T-numbers from the Advanced Dvorak Technique over a three-hour period centered on the nominal observation time.